MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2017/2018

PMT0204 – FUNDAMENTAL MATHEMATICS II

(All sections / Groups)

27 OCTOBER 2017
9.00 a.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **THREE (3)** printed pages including the cover page with 4 questions only.
2. Answer all **FOUR (4)** questions
3. Write all your answers in the answer booklet provided.
4. Only NON-PROGRAMMABLE calculators are allowed.

Question 1 (25 Marks)

a) Simplify the following:

i. $\begin{bmatrix}1 & 7\\ 2 & -3\\ 1 & 0\end{bmatrix}\begin{bmatrix}1 & -3 & 2\\ 2 & 6 & -1\end{bmatrix}$ **(4 marks)**

ii. $\begin{bmatrix}2 & 3\\ -1 & 3\end{bmatrix}\left(\begin{bmatrix}2 & -3\\ 5 & 4\end{bmatrix}-\begin{bmatrix}1 & 8\\ 4 & 4\end{bmatrix}\right)$ **(4 marks)**

b) Solve for x and y.

$$\begin{bmatrix}1 & x\\ 2 & y\end{bmatrix}\begin{bmatrix}2 & 1\\ x & 3\end{bmatrix}=\begin{bmatrix}3 & 4\\ 3 & y\end{bmatrix}$$ **(6 marks)**

c) Solve the given system by using Cramer's rule.

$$2x+y+3z=2$$
$$x+2z=1$$
$$y+z=4$$ **(11 marks)**

Question 2 (25 Marks)

a) Find the remaining trigonometric functions given

$$\csc\theta=-\frac{5}{3};\ \cot\theta<0$$ **(6 marks)**

b) Graph the function $y=4\sin(2x+4\pi)-2$.
Find amplitude, period and phase shift from the graph. **(9 marks)**

c) Find the angle(s) and side(s) of the triangle ABC given $a=3, b=5, C=80°$. **(5 marks)**

d) Find the area of a triangle with $a=10, b=7, c=8$. **(5 marks)**

Continued...

Question 3 (25 Marks)

a) Find the limit if exist.

i. $\lim_{x\to -1}(2x^2+6x-1)$ **(2 marks)**

ii. $\lim_{x\to 2}\dfrac{x^2-4}{x^2-3x+2}$ **(4 marks)**

iii. $\lim_{x\to \infty}\dfrac{x^2+1}{2x^2}$ **(4 marks)**

b) Differentiate the following:

i. $y=(x^3+7x^2)(x^3-x^2+5)$ **(4 marks)**

ii. $y=\dfrac{x(x+1)}{2x^2+3}$ **(5 marks)**

iii. $y=(8+2x)(x^2+1)^4$ **(6 marks)**

Question 4 (25 Marks)

a) Indicate intervals on which the function is increasing, decreasing, concave up and concave down. **(10 marks)**

$$y = 2x^3 + 15x^2 + 36x + 9$$

b) Determine the integrals.

i. $\int_0^{12}(\sqrt{3}x+3x^2)dx$ **(4 marks)**

ii. $\int_0^{1}(x^2+x)(2x+1)dx$ **(5 marks)**

c) Find the volume of the solid formed when the curve $4x^2+y^2=4$ rotated about the $x-$ axis in the interval $[-1,1]$. **(6 marks)**

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